Curriculum Vitae

KARL G. LINDEN

Helen and Huber Croft Professor
Dept. of Civil, Environmental, and
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Education

Ph.D., Civil and Environmental Engineering, University of California, Davis. March 1997.

M.S., Civil and Environmental Engineering, University of California, Davis. March 1993.

B.S., Agricultural and Biological Engineering, Cornell University, Ithaca, NY, May 1989.

Areas of Specialization

Teaching

Areas of competence include water and wastewater treatment processes (physical, chemical, and biological), water reuse, UV processes in environmental systems, environmental aquatic chemistry, ecological environmental engineering, water treatment process laboratory, aqueous chemistry laboratory. Other teaching interests include bioremediation, environmental toxicology, and natural treatment processes. Experience with students diverse in age, ability, and ethnicity.

Research

Research focuses on investigation of alternative disinfectants and advanced oxidation for water and wastewater treatment. Specifically, efficacy of UV irradiation for inactivation of persistent and emerging pathogens; and the investigation of advanced oxidation processes for the degradation of environmental pollutants of concern in clean and reclaimed water for reuse. Other experience in biological treatment processes, environmental toxicology, industrial wastewater treatment, greywater reuse, streambank stabilization and classification, natural treatment technologies, appropriate treatment technologies, bioremediation techniques, and anaerobic treatment processes.

Honors, Awards, and Distinctions

Trustee, Water Science and Research Division, American Water Works Assoc. 2011-2014

Distinguished Faculty Award, University of Colorado, CEAE Department, 2011

Best Paper of the Year, Journal AWWA 2010. "Demonstrating 4-log Adenovirus Inactivation in a Medium-Pressure Ultraviolet Disinfection Reactor", *Journal AWWA* , 101 (4) 90+

Liebman Faculty Fellow, University of Colorado School of Engineering, 2008 – 2010

Research Development Award, University of Colorado, CEAE Department, 2009

Best Student Paper Award to Ph.D. advisee Anne C. Eischeid, Water Quality Technology Conference, AWWA, Cincinnati, OH 2008.

RMIT International Fellow – Royal Melbourne Institute of Technology, Australia 2007-08

2nd Place Best Doctoral Dissertation. Award to Ph.D. advisee Erik Rosenfeldt, AWWA 2008

Klein/Stansell Family Distinguished Research Award, Pratt School of Engineering, 2004
John-Kelly C. Warren Faculty Scholar, Pratt School of Eng., Duke University 2001-2005
Switzer Environmental Foundation Leadership Fellow: 2001-2003
National Science Foundation New Century Scholar: 1998
UNC-Charlotte Junior Faculty Fellowship - 1998
Trojan Technologies UV Fellow, 1995-96
Switzer Foundation Environmental Fellowship recipient, 1993-94
Chancellors Teaching Fellowship, UC Davis, 1994
USDOE, Graduate Assistance in Areas of National Need - Civil Engineering, 1993-94
Malcolm Stacey Fellowship, UC Davis, 1993-94; 1994-95
Fellow, Professional Studies Program in India, UC Berkeley, 1991-92
National Science Foundation Research Experience for Undergraduates, 1988

Professional Experience

Academic

January 2008 – Present. Full Professor, Department of Civil, Environmental and Architectural Engineering, University of Colorado at Boulder, Boulder, CO.

April 2009 – Present. Associate Director of Education and Research, Mortensen Center in Engineering for Developing Communities, University of Colorado at Boulder, CO.

July 2005 – December 2007. Associate Professor with Tenure, Department of Civil and Environmental Engineering, Pratt School of Engineering, Duke University, Durham, NC

January 2001 – June 2005. John-Kelly C. Warren Assistant Professor, Department of Civil and Environmental Engineering, Pratt School of Engineering, Duke University, Durham, NC

July 1999 – 2001. Assistant Professor, Department of Civil and Environmental Engineering, School of Engineering, Duke University

August 1997 – June 1999. Assistant Professor, Department of Civil Engineering, University of North Carolina at Charlotte

June 1990 - June 1991, April 1992 – December 1996. Research Assistant, Department of Civil and Environmental Engineering, UC Davis

September 1992 – March 1995. Teaching Assistant, Department of Civil and Environmental Engineering, UC Davis

Professional Affiliations

American Society of Civil Engineers
American Water Works Association
Association of Environmental Engineering and Science Professors

International UV Association

Academic and Professional Service

Department Research Committee: CU Boulder CEAE, Aug 2008 – Present

First Level Review Committee: College of Engineering and Applied Science, Aug 2008 - Present

Personnel Committee, CU Boulder CEAE, Aug 2008 – Present

Associate Editor, ASCE: Journal of Environmental Engineering, 2005 - Present

Member, University Student Activities Committee, AWWA, 2004-Present

Technical Committee Co-Chair, IUVA/IOA North American Congress, Boston, MA, 2009

Co-Chair, Advanced Oxidation Session, Leading Edge Technologies Conference, IWA, Zurich, Switzerland June 1-4, 2008

US EPA UV Disinfection Guidance Manual, Co-Author, US EPA, Jan. 2001 – 2006

WateReuse Foundation Research Needs Workshop, San Diego, CA Dec 1-3, 2009

WateReuse Foundation Research Needs Workshop, San Diego, CA Nov 28-30, 2006

Co-Chair, First Mid-East Conference on UV Technologies, Tel Aviv Israel, Nov 2005.

Founding Member/Board Member, International Ultraviolet Association, April 1999 – present

International Vice President, International Ultraviolet Association, June 2001 – present

Teaching Experiences

University of Colorado at Boulder (Professor)

Fundamentals of Environmental Engineering, CVEN 3414 - Fall 2008, 2009
Required undergraduate course on science and design of Environmental Engineering processes including water and wastewater treatment, solids waste, air quality, and hazardous waste treatment.

UV Processes in Environmental Systems, CVEN 5834 – Fall 2006, Spring 2010
Elective course for advanced graduate students interested in photolysis and oxidation in water and wastewater, including disinfection and advanced oxidation processes.

Water Sanitation and Hygiene, CVEN 5834-03 – Fall 2008, 2009
Graduate course in the Engineering for Developing Communities program covering appropriate treatment technologies for applications in water, air and sanitation in rural and developing communities.

Sustainable Water Reuse, CVEN 5834 – Spring 2009
Advanced graduate course focusing on the social, political, and technical aspects of implementing water reuse.

Duke University (Assistant/Associate Professor)

Introduction to Engineering, EGR 010 – Spring 2001, 2002, 2004
Introduction to environmental engineering for freshmen Pratt School of Engineering Students, Team-taught with Joe Nadeau

Environmental Engineering, CEE 124L - Fall 1999
Senior level undergraduate course on science and design of water and wastewater treatment processes, solids waste handling, air quality, and hazardous waste treatment

Chemistry and Microbiology for Environmental Engineers, CEE 120L – Fall 2000 - 2002
Required for undergrad environ. eng. majors integrating research and model lab exercises

Physical and Chemical Treatment Processes, CEE 241 – Fall 2000, 2002, 2004, Spr 2006
Core graduate level science and design course guided toward open-ended problem solving utilizing fundamentals learned in class

Advanced Water Treatment Laboratory, CEE 265.2L - Fall 2001, Fall 2007
Elective graduate laboratory course on treatment of emerging contaminants with advanced treatment technologies (membranes, GAC, UV oxidation, others)

UV Processes in Environmental Systems, CEE 265L/269 – Spring 2000, 2004, Fall 2005
Elective course for advanced graduate students interested in photolysis and oxidation

Ecological Environmental Engineering, CEE 265L – Spring 2005
Elective course for advanced graduate students interested in natural/alternative treatment systems and water sanitation issues relevant to developing countries

Research Funding

As Principal Investigator (Representative of >$9M in funding)

1. "IRES: Toward Sustainable Water and Sanitation Infrastructure" National Science Foundation OISE - 1065050 (4/11 - 3/14) Linden K.G. (PI)
2. "Advanced Oxidation and Transformation of Organic Contaminants" Water Research Foundation 4241, (1/11 – 7/13) Linden K.G. (PI), von Gunten, U. (Co-PI)
3. "Investigating Underlying Mechanisms Resulting in Resistance of Adenoviruses to UV Disinfection" National Science Foundation. (9/09 – 8/12) Linden K.G. (PI)
4. "Water Reuse 2030" WateReuse Foundation (2/09 – 1/10) Linden K.G. (PI), Drewes, J; Khan S. (Co-PIs)
5. "Fundamental Mechanisms behind the Extreme Resistance of Adenoviruses to UV Disinfection" National Science Foundation SGER. (9/08 – 8/09) Linden K.G. (PI)
6. "UV-Based Advanced Oxidation Treatment of Pre- and Post-GAC Contacted Water" American Water Works Association Research Foundation (3/08 – 8/09) Linden, K.G. (PI)
7. "Impact of UV Location and Sequence on Byproduct Formation" American Water Works Association Research Foundation (10/07 – 1/10) Linden K.G. (PI), Weinberg H. (UNC), Mitch W. (Yale) (Co-PIs)

8. "Enhanced Disinfection of Adenoviruses with UV Irradiation" WateReuse Foundation Unsolicited Project (2/07 – 3/09), Linden K.G. (PI), Thurston J. (USDA) (Co-PI)
9. "Presence, Fate, and Treatability of Estro- and Androgenic Contaminants in Wastewater and Biosolids" US EPA Office of WW Management (5/06 – 5/08) Linden K.G. (PI), Kullman, S.W. (Co-PI).
10. "Innovative Technologies for Treatment of Reclaimed Water" Water Reuse Foundation (1/06-12/08) Linden K.G. (PI), Salveson, A., Thurston-Enriquez, J. (Co-PIs)
11. "Pulsed UV versus Low to Medium Pressure UV: Evaluation of Drinking Water Treatment Efficiency" US EPA (9/04-3/08) Linden, K.G. (PI)
12. "Impact of UV and UV Advanced Oxidation Processes on Toxicity of Endocrine Disrupting Compounds in Water" American Water Works Association Research Foundation, (2/03-7/06) Linden, K.G. (PI), Kullman, S.
13. "Advanced Oxidation Processes for the Treatment of Candidate Contaminant List (CCL) Chemicals" US EPA Office of Water, Cooperative Agreement, (9/01 – 8/06) Linden, K.G. (PI), Sharpless, C., Suffet, I.H.
14. "Effectiveness of UV Irradiation for Pathogen Inactivation in Surface Waters" US EPA Science To Achieve Results Program, (9/01 – 10/05) Linden, K.G. (PI), Sobsey, M.D.

As Co-Principal Investigator ($ is amount to Linden unless noted; representative funding)

1. "Demonstrating Advanced Oxidation Technologies on Pharmaceutical Removal Downstream of Biological Treatment" Water Environment Research Foundation INFR 6SG09 (1/10 – 5/11) Linden K.G. (Co-PI)
2. "Constructed Wetlands and UV Disinfection for Wastewater Treatment and Reuse in Small Communities" Multinational Agricultural Research and Development Program, US-Israeli Bi-National Agricultural Research and Development Fund. BARD FG-9502-09 (4/10 – 3/11) Linden K.G. (Co-PI)
3. "Heterogeneous Photocatalytic System for Water Remediation" Eltron Research (NIEHS), (8/09 – 4/10) Linden (Co-PI).
4. Workshop: "Ensuring the Sustainable Reuse of Wastewater for Agricultural Irrigation in Semi-Arid Regions" U.S.-Israel Binational Science Foundation, Linden (Co-PI), Zoller (PI) (2008)
5. "Superfund Chemicals Impact on Reproduction and Development, Project 7: Microbial and Photolytic Transformations of Superfund Chemicals", Subcontract from Superfund Hazardous Substances Basic Research Center, Dr. DiGiulio, Duke University, (4/05 – 4/09).
6. "DNA repair of UV irradiated Giardia lamblia cysts following low and medium pressure UV disinfection" National Science Foundation, Linden, K.G. (Co-PI), Gwy-Am Shin (PI), (7/03 – 8/06)

Peer Reviewed Publications (Selected from a total of >98)

Notes: Names in **Bold** from Linden's Lab, * indicates Linden is corresponding author; ^ denotes work published prior to academic appointments.

1. **Eischeid, A.,** Thurston, J., ***Linden, K.G.** (2011) " UV Disinfection of Adenovirus: Current State of the Research and Future Directions" *Critical Reviews in Environmental Science and Technology* Accepted
2. Park, G-W., Vinjie, J., **Linden, K.G.**, Sobsey, M.D. (2011) "Comparative UV inactivation of murine norovirus, feline calicivirus, echovirus 12 and coliphage" Accepted in *Letters in Applied Microbiology* Vol. 52, No. 2. 162-167
3. **Eischeid, A., and *Linden, K.G.** (2011) "Molecular Indications of Protein Damage in Adenoviruses after UV Disinfection" *Applied and Environmental Microbiology*, Vol. 77, No. 3. Pp 1145-1147
4. **Chatterley, C.J. and *Linden K.G.** (2010) "Demonstration and evaluation of germicidal UV-LEDs for point-of-use water disinfection" *Journal of Water and Health*, Vol. 8, No. 3, pp 479 – 486.
5. **Dotson, A.D., Keen, V**. Metz, D. ***Linden K.G.** (2010) UV/H2O2 treatment of drinking water increases post-chlorination DBP formation" *Water Research* Vol. 44, p. 3703-3713.
6. Reckhow, D.A., **Linden, K.G.,** Kim, J., **Shemer, H.,** Makdissy, G. (2010) "Effect of UV Treatment on DBP Formation", *Journal of the American Water Works Association*, Vol. 102, No. 6, pp 100-113.
7. **Wu, C., *Linden, K.G.** (2010) "Phototransformation of selected organophosphorus pesticides: Roles of hydroxyl and carbonate radicals" *Water Research*, Vol. 44, p. 3585-3594.
8. **Watts, M.J., *Linden, K.G.** (2009) "Advanced oxidation kinetics of aqueous tri alkyl phosphate flame retardants and plasticizers" *Environmental Science and Technology* Vol. 43, No. 8, 2937-2942.
9. ***Linden, K.G**., Shin, G-A., Lee, J-K., Scheible, O.K., Shen, C., Posy, P. (2009) "Demonstrating 4-log Adenovirus Inactivation in a Medium-Pressure Ultraviolet Disinfection Reactor", *Journal AWWA* , Vol. 101, No. 4, 90+
10. **Mamane, H., Bohrerova, Z., *Linden, K.G.** (2009) "Evaluation of Bacillus spore survival and surface morphology following chlorine and UV disinfection in water" *ASCE: Journal of Environmental Engineering* Vol. 135 No. 8, 692-699.
11. Slotkin, T., Seidler, F., **Wu, C**, MacKillop, E., **Linden, K**. (2009) Photolytic Breakdown Products of Chlorpyrifos: Developmental Neurotoxicity Evaluated in PC12 Cells, *Environmental Health Perspectives* Vol. 117, No. 3, 338–343.
12. **Bohrerova, Z**., Bohrer, G., **Cho, K.D., Linden, K.G.** (2009) "Determining the viability response of pine pollen to atmospheric conditions during long-distance dispersal" *Ecological Applications* Vol. 19, No. 3, 656-667.
13. **Eischeid, A.C**., Meyer, J., ***Linden, K.G**. (2009) "UV Disinfection of Adenoviruses:

Molecular Indications of DNA Damage Efficiency" *Applied and Environmental Microbiology*, Vol. 75, No. 1, 23-28.

14. **Watts, M.J., *Linden, K.G.** (2008) "Photooxidation and subsequent biodegradability of recalcitrant tri-alkyl phosphates TCEP and TBP in water" *Water Research*, Vol. 42, No. 20, 4949-4954
15. **Wu, C., *Linden, K.G**., (2008) "Degradation and Byproducts Formation of Parathion in Aqueous Solutions by UV and UV/H_2O_2 Treatment", *Water Research*, Vol. 42, No. 19, 4780-4790.
16. **Bohrerova, Z., Shemer, H.,** Lantis, B., Impellitteri, C.,***Linden, K.G**. (2008) "Comparative Disinfection Efficiency of Pulsed and Continuous-Wave UV Irradiation Technologies" *Water Research* Vol. 42, No. 12, 2975-2982
17. ***Linden, K.G.**, Thurston, J., Schaefer, R., Malley, J.P. Jr. (2007) "Enhanced UV Inactivation of Adenoviruses under Polychromatic UV Lamps" *Applied and Environmental Microbiology*, Vol. 73, No. 23, 7571–7574
18. **Watts, M.J., Rosenfeldt, E.J., *Linden, K.G.** (2007) "Comparative OH radical oxidation using UV-Cl2 and UV-H2O2 processes" *Journal WSRT-AQUA,* Vol. 56, No. 8, 469-478.
19. Pereira, V.J., ***Linden, K.G.,** Weinberg, H.S. (2007) "Evaluation of UV irradiation for photolytic and oxidative degradation of pharmaceutical compounds in water" *Water Research* Vol. 41, No. 19, 4413 – 4423
20. **Wu, C., Shemer, H., *Linden, K.G.** (2007) "Photodegradation and Byproduct Formation of Metolachlor in Water via UV and UV/H_2O_2 Treatment" *J. Agric. Food Chem.* Vol. 55, No. 10, 4059-4065.
21. **Bohrerova, Z., *Linden, K.G.** (2007) "Standardizing Photoreactivation: Comparison of DNA Photorepair Rate in Escherichia coli Using Four Different Fluorescent Lamps" *Water Research,* Vol. 41, No. 12, 2832-2838.
22. **Rosenfeldt, E.J**., ***Linden, K.G.**, (2007) "Hydroxyl radical formation during the UV/H_2O_2 processes: The $R_{OH/UV}$ concept" *Environmental Science and Technology.* Vol. 41, No. 7, 2548-2553
23. **Mamane, H., Shemer, H. *Linden, K.G.** (2007) "Inactivation of *E. coli*, *B. subtilis* spores, and MS2, T4, and T7 phage using UV/H_2O_2 advanced oxidation" *Journal of Hazardous Materials*. Vol. 146, 479‐ 486
24. Pereira, V.J., Weinberg, H.S., **Linden, K.G.,** Singer, P.C. (2007) "UV degradation of pharmaceutical compounds in surface water via direct and indirect photolysis at 254 nm" *Environmental Science and Technology* Vol. 41, No 5, 1682-1688.
25. **Shemer, H., *Linden, K.G.** (2007) "Photolysis, oxidation and subsequent toxicity of a mixture of polycyclic aromatic hydrocarbons in natural waters", *Journal of Photochemistry and Photobiology A: Chemistry* Vol. 187, No. 2-3, 186-195
26. **Rosenfeldt, E.J**., **Linden, K.G.**, Canonica, S., von Gunten, U. (2006) "Comparative efficiency of OH radical generation from ozone and UV based processes" *Water Research* Vol. 40, No. 20, 3695 – 3704

27. **Shemer, H., Sharpless, C.M.,** Elovitz, M.S., ***Linden, K.G**. (2006) "Relative rate constants of contaminant candidate list pesticides with hydroxyl radicals" *Environmental Science and Technology* Vol. 40, 4460-4466
28. **Bohrerova, Z., *Linden, K.G.** (2006) Molecular Based Assessments of Inactivation and Photorepair of *Mycobacterium terrae* following UV Disinfection" Journal of *Applied Microbiology* Vol. 101, 995–1001
29. **Mamane-Gravetz, H. and *Linden, K.G.** (2006). "Impact of particle aggregated microbes on UV disinfection. Part I: discrepancy between spore-clay aggregates and suspended spores" *ASCE Journal of Environmental Engineering* Vol. 132, No. 6, 596-606.
30. **Mamane-Gravetz, H. and *Linden, K.G.** (2006). "Impact of particle aggregated microbes on UV disinfection. Part II: importance of proper absorbance measurement on UV dose determination" *ASCE Journal of Environmental Engineering* Vol. 132, No. 6, 607-615
31. **Shemer, H., *Linden, K.G.** (2006) "Degradation and byproduct formation of diazinon using UV and UV/H_2O_2 processes", *Journal of Hazardous Materials* Vol. 136, No. 3, 553-559
32. **Mamane-Gravetz, H.**, Ducoste, J., ***Linden, K.** (2006) "Impact of Particles on UV Light Penetration in Natural and Engineered Systems" *Applied Optics* Vol. 45, No. 8, 1844-1856.
33. **Shemer, H**., Kunukcu, Y.K., ***Linden, K.G.** (2006) "Degradation of the Pharmaceutical Metronidazole Via UV, Fenton and photo-Fenton Processes, *Chemosphere* Vol. 63, 269-276.
34. **Rosenfeldt, E.J.**, Melcher, B., and ***Linden, K.G.** (2005) "Treatment of Taste and Odor Causing Compounds in Water by UV and UV/H_2O_2 Processes", *Journal of Water Supply: Research & Technology –AQUA* Vol. 54, No. 7, 423-434.
35. **Ormeci, B.**, and ***Linden, K.G.** (2005) "Comparison of Physical and Chemical Methods for Extraction of Microorganisms from Wastewater Particles and Flocs" *Environmental Engineering Science,* Vol. 22, No. 4, 459-471.
36. Johnson, A.M., **Linden, K.G**., Ciociola, K.M., De Leon, R., Widmer, G. Rochelle, P.A. (2005) "UV inactivation of *Cryptosporidium hominis* as measured in cell culture" *Applied and Environmental Microbiology,* Vol. 71, No. 5, 2800-2802.
37. **Jin, S., *Linden, K.G.,** Ducoste, J., Liu, D. (2005) "Impact of Lamp Shadowing and Reflection on the Fluence Rate Distribution in a Multiple Low-Pressure UV Lamp Array" *Water Research,* Vol. 39, No. 12, 2711-2721.
38. **Ormeci, B.,** Ducoste, J., and ***Linden, K.G.** (2005) "UV Disinfection of Chlorinated Water: Impact on Chlorine Concentration and UV Dose Delivery", *Journal of Water Supply: Research & Technology –AQUA,* Vol. 54, No. 3, 189-199.
39. Shin, G-A., **Linden, K.G.,** Faubert, G., Sobsey, M.D. (2005) "Inactivation of *Giardia lamblia* cysts by UV irradiation in real field waters" *Journal of Water and Environment Technology.* Vol. 3, No. 1, 41-45.

40. **Mamane-Gravetz, H.** and ***Linden, K.G.** (2005) "The relationship between physiochemical properties, aggregation, and UV inactivation of isolated indigenous spores in water", *Journal of Applied Microbiology* Vol. 98, No. 2, 351-363.
41. Mofidi, A.A., and **Linden, K.G.**, (2004) "Disinfection Effectiveness of Ultraviolet Light for Heterotrophic Bacteria Leaving Biologically Active Filters" *Journal of Water Supply: Research & Technology –AQUA* Vol. 53 No. 8, 553-566
42. **Rosenfeldt, E**. and ***Linden, K.G**. (2004) "Degradation of endocrine disrupting chemicals bisphenol-A, ethinyl estradiol, and estradiol during UV photolysis and advanced oxidation processes" *Environmental Science and Technology,* Vol. 38 No. 20, 5476-5483
43. **Batch, L.F.,** Schulz, C.D., and ***Linden, K.G.** (2004) "Evaluating Water Quality Impacts on UV Disinfection of MS2 Coliphage in Filtered Water" *Journal of the American Water Works Association,* Vol. 96, No. 7, pp. 75-87.
44. **Mamane-Gravetz, H.** and ***Linden, K.G.** (2004) "UV disinfection of indigenous aerobic spores: implications for UV reactor validation with unfiltered waters", *Water Research* Vol. 38, No. 12, pp. 2898-2906
45. Kashinkunti, R., **Linden, K.G.**, Shin, G-A, Metz, D.H., Sobsey, M.D., Moran, M. and Samuelson, A. (2004) "Investigating Multi-Barrier Inactivation for Cincinnati: UV, By-products, and Biostability" *Journal of the American Water Works Association,* Vol. 96, No. 6, pp. 114-127.
46. **Christensen, J.A.** and ***Linden, K.G.** (2003) "How Particles Affect UV Light in the UV Disinfection of Unfiltered Drinking Water" *Journal of the American Water Works Association,* Vol. 95 No. 4, pp. 179-189.
47. **Sharpless, C.M**. and ***Linden, K.G.** (2003) "Experimental and Model Comparisons of Low- and Medium-Pressure Hg Lamps for the Direct and H_2O_2 Assisted UV Photodegradation of N-nitrosodimethylamine in Simulated Drinking Water", *Environmental Science and Technology*, Vol. 37 No. 9, pp. 1933-1940
48. Bolton, J.R. and ***Linden, K.G.** (2003) "Standardization of Methods for Fluence (UV Dose) Determination in Bench-scale UV Experiments" *ASCE: Journal of Environmental Engineering,* Vol. 129 No. 3. pp 209-215.
49. ***Linden, K.G.** Shin, G.A., Faubert, G., Cairns, W., Sobsey, M.D. (2002) "UV disinfection of *Giardia lamblia* in water". *Environmental Science and Technology*, Vol. 36 No. 11, pp. 2519-2522.
50. **Sharpless, C.M.**, and ***Linden, K.G.** (2001) "UV photolysis of nitrate: quantum yields, effects of natural organic matter and dissolved CO_2, and implications for UV water disinfection" *Environmental Science and Technology*, Vol. 35 No. 14, pp. 2949-2955.
51. ***Linden, K.G**., Shin, G.A., and Sobsey, M.D. (2001) "Relative efficacy of UV wavelengths for the inactivation of *Cryptosporidium parvum*" *Water Science and Technology*, Vol. 43 No. 12, pp. 171-174.

Details available upon request

Conference Proceedings (Competitive Peer Reviewed Abstracts): 133 (not listed)

Major Conference Presentations: 41 (not listed)

Invited Lectures/Presentations/Workshops: 108 (not listed)

Posters Presented at Conferences: 15 (not listed)

Graduate Students Theses Directed or Co-Directed

15 Masters Degree

11 Ph.D. Students

Undergraduate Researchers Directed: 10

High School Students Directed: 4

Post-Doctoral Researchers Directed: 8

Visiting Researchers Hosted: 3